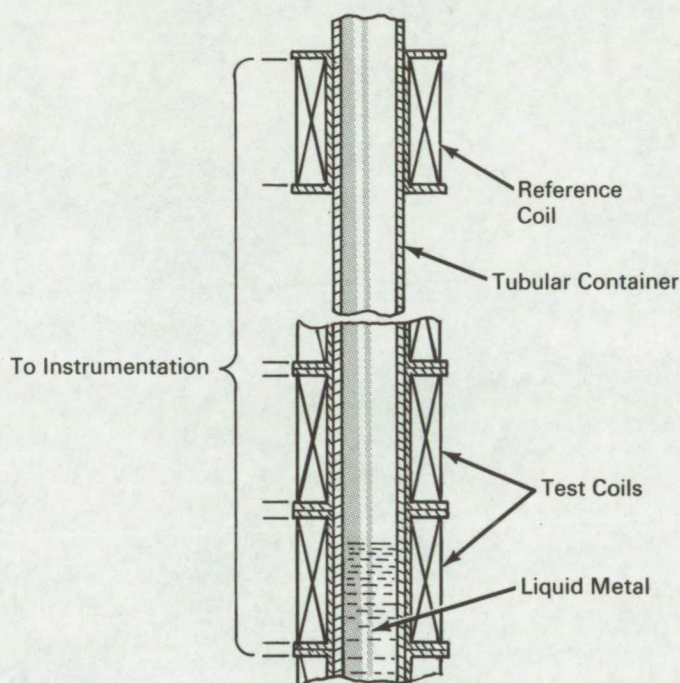


NASA TECH BRIEF



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Inductive System Detects Level of Conducting Fluids



The problem:

To monitor the liquid level of a conductive fluid that is at a high temperature in a fully closed opaque container. It is required that no penetration of the container be made and that no extraneous matter, float, or plug be inserted.

The solution:

A system that takes advantage of the self-inductance characteristic of a solenoid with respect to the fluid material inserted into its core.

How it's done:

Axially aligned coils surround a tubular container that is partially filled with liquid metal at an elevated

temperature (approximately 700°F). The amount of liquid metal in the tubular space within a given coil determines the self-inductance of that coil. A reference coil, having a constant self-inductance, is used to compare the self-inductances of the test coils. An automatic stepper switch connects each coil in succession to a bridge circuit for comparison with the reference coil. A series of lights and meters indicates the liquid level in the container since each meter represents a specific segment of the container column and each energized light represents a filled segment. A separate meter is used to indicate, in terms of a scale reading, the exact location of the fluid surface in the

(continued overleaf)

uppermost segment containing, but not filled with, the liquid metal.

Notes:

1. This system was used successfully in a two-phase mercury loop and would be useful in any high-temperature liquid-metal system.
2. The system shows fast response time and is relatively insensitive to temperature fluctuations.
3. Inquiries concerning this invention may be directed to:

Technology Utilization Officer
Lewis Research Center
21000 Brookpark Road
Cleveland, Ohio 44135
Reference: B66-10392

Patent status:

This invention is owned by NASA, and a patent application has been filed. Royalty-free, nonexclusive licenses for its commercial use will be granted by NASA. Inquiries concerning license rights should be made to NASA, Code GP, Washington, D.C. 20546.

Source: Paul W. Roeske et al
(Lewis-322)